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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,885	02/09/2004	Alexander Berger	MS307300.1/MSFTP606US	8812

27195 7590 12/05/2006

AMIN. TUROCY & CALVIN, LLP
24TH FLOOR, NATIONAL CITY CENTER
1900 EAST NINTH STREET
CLEVELAND, OH 44114

EXAMINER	
DAYE, CHELCIE L	

ART UNIT	PAPER NUMBER
2161	

DATE MAILED: 12/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/774,885	BERGER ET AL.	
	Examiner	Art Unit	
	Chelcie Daye	2161	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25 and 27-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25 and 27-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/19/2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is issued in response to applicant's amendment filed October 19, 2006.

2. Claims 1-25 and 27-31 are presented. No claims added and claim 26 cancelled.

3. Claims 1-25 and 27-31 are pending.

4. Applicant's arguments filed October 19, 2006, have been fully considered but they are not persuasive.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-25 and 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mittal (US Patent Application No. 20050138001) provisional filed December 23, 2003, in view of Agrawal (US Patent No. 5,926,820) filed February 27, 1997, and further in view of Ballamkonda (US Patent No. 6,775,682) filed February 26, 2002.

Regarding Claims 1,9,10,and 14, Mittal discloses a distinct count query system implemented on a machine comprising:

a query process component ([0047], lines 1-10, Mittal) to retrieve a plurality of partitions from a database (Fig.4; [0058], lines 1-22, Mittal)[1]. However, Mittal is silent with respect to a range component that determines the maximum and minimum values associated with each partition. On the other hand, Agrawal discloses a range component that determines the maximum and minimum values associated with each partition (columns 6-7, lines 60-67 and 1-17, respectively, Agrawal). Mittal and Agrawal are analogous art because they are from the same field of endeavor of efficiently performing a distinct count metric. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Agrawal's teachings into the Mittal system. A skilled artisan would have been motivated to combine as suggested by Agrawal at column 3, lines 36-43, in order to allow queries which specify ranges over multiple dimensions to be processed quickly in the average case. As well as to allow each dimension to have a space overhead which is linear in the number of data points. However, the combination of Mittal in view of Agrawal are silent with respect to a group component that utilizes the maximum and minimum range values to determine independent partitions or partition groups, wherein independent partitions or partition groups are executed concurrently with other partitions. On the other hand, Ballamkonda discloses a group component that utilizes the maximum and minimum range values to determine independent partitions or partition groups (column 10, lines 46-51, Ballamkonda), wherein independent partitions or

[1] Examiner Notes: "Dimensions" corresponds with partitions.

partition groups are executed concurrently with other partitions (column 10, lines 10-28, Ballamkonda)[2]. The combination of Mittal in view of Agrawal, and further in view of Ballamkonda are analogous art because they are from the same field of endeavor of efficiently evaluating database queries including distinct aggregates. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Ballamkonda's teachings into the Mittal in view of Agrawal system. A skilled artisan would have been motivated to combine as suggested by Ballamkonda at column 4, lines 32-41, in order to have fewer data records to sort and from which to eliminate duplicates, resulting in a more proficient database system.

Regarding Claim 2, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose the system wherein the database is an OLAP database (column 3, lines 45-51, Agrawal).

Regarding Claim 3, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose the system further comprising a buffer component to facilitate execution of the distinct count query on sections of the partitions (column 7, lines 8-18, Ballamkonda).

[2] Examiner Notes: "Parallel" corresponds with concurrent.

Regarding Claims 4 and 15, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose the system wherein the partitions contain one or more numeric identifiers (Fig.5; [0061], lines 1-16, Mittal).

Regarding Claims 5,12,16,and 17, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose the system wherein the numeric identifiers are ordered in ascending order from smallest to largest value (Fig.5, Mittal).

Regarding Claim 6, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose the system wherein the numeric identifier is a customer ID (Fig.3; [0035], lines 1-18, Mittal).

Regarding Claim 7, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose the system wherein the numeric identifier is a product ID (Fig.3; [0035], lines 1-18, Mittal).

Regarding Claims 8 and 20, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose the system wherein partitions with overlapping ranges are executed in parallel (column 4, lines 32-46, Agrawal).

Regarding Claims 11 and 19, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose the system wherein the independent partition groups have a non-overlapping range with respect to other partitions (columns 7-8, lines 50-67 and 1-10, respectively, Agrawal)[3].

Regarding Claim 13, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose the system wherein the database is a multidimensional database ([0020], lines 1-4, Mittal).

Regarding Claim 18, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose the method wherein the ranges are determined by retrieving the first and last values from each partition (columns 6-7, lines 60-67 and 1-17, respectively, Agrawal).

Regarding Claim 21, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose a tangible computer readable medium having stored thereon computer executable instructions for carrying out the method ([0044], lines 1-12, Mittal).

[3] Examiner Notes: Any of the partitions with ranges that are not intersecting is considered to be non-overlapping.

Regarding Claims 22 and 23, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose a machine implemented method for executing a distinct count query on a database comprising:

pre-aggregating database data (Fig.4; [0058], lines 1-22, Mittal)[4];

determining a minimum and maximum range of a plurality of data partitions (columns 6-7, lines 60-67 and 1-17, respectively, Agrawal);

identifying independent partition groups to be executed simultaneously with other queried partitions (column 10, lines 10-28, Ballamkonda), the independent partition groups including one or more partitions with a non-overlapping range with respect to other queried partitions (columns 7-8, lines 50-67 and 1-10, respectively, Agrawal).

Regarding Claim 24, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose the method wherein data is separated automatically based on heuristics associated with the database (column 9, lines 45-67, Ballamkonda).

Regarding Claim 25, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose the method wherein pre-aggregating database data comprises ordering partition data (Fig.5, Mittal).

Regarding Claim 27, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose the method wherein pre-aggregating database data comprises eliminating redundant data in each partition (column 10, lines 29-45, Ballamkonda).

Regarding Claim 28, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose the method wherein the other queried partitions include overlapping ranges, which are executed synchronously and in parallel (column 4, lines 32-46, Agrawal).

Regarding Claim 29, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose the method further comprising executing the distinct count query on sections of partitions utilizing a buffer (column 7, lines 8-18, Ballamkonda).

Regarding Claim 30, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose the method the database is an OLAP database (column 3, lines 45-51, Agrawal).

Regarding Claim 31, the combination of Mittal in view of Agrawal, and further in view of Ballamkonda, disclose a tangible computer readable medium

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[4] Examiner Notes: Applicant has disclosed "pre-aggregating" to include partitioning and ordering data.

having stored thereon computer executable instructions for carrying out the method ([0044], lines 1-12, Mittal).

Response to Arguments

Applicant argues, Agrawal fails to teach, "a range component that determines the maximum and minimum values associated with each partition".

Examiner respectfully disagrees. As stated in the action above, Agrawal discloses at columns 6-7, lines 60-67 and 1-17, respectively, wherein a data cube is partitioned into blocks. For each block the minimum or maximum value is determined for the index of the cell within each block. Then a range maximum or range minimum result is determined from the values of the cells within each block. Examiner notes, according to the Merriam-Webster Online Dictionary, the definition of range is the difference between the least and greatest values of a variable. Therefore, whether the result is a range minimum result or a range maximum result, within the range result there is at least a representation of a least value and a greater value.

Applicant argues, Ballamkonda does not teach, "determining independent partitions or partition groups, wherein independent partitions or partitions groups are executed concurrently with other partitions".

Examiner respectfully disagrees. As stated in the action above, Ballamkonda discloses at column 10, lines 10-51; wherein partitioning that occurs between stages 2

Therefore, "dimensions" correspond to the partitions and Fig.4 show the dimensions in an ordered state.

and 3 are on grouping keys and can utilize range partitioning. The grouping keys use grouping identifiers, which uniquely identifies the grouping of partitions by a rollup operation. Grouping of the partitions between stages 2 and 3 represent the limitation of determining partition groups with the range partition. Also, a parallel evaluation of a rollup grouping occurs and a fact table along with other associated tables are scanned, joined, sorted, and eliminated so less data is forwarded. The parallel evaluation corresponds with the concurrent execution. Therefore, Ballamkonda does disclose the limitation of independent partitions or partitions groups are executed concurrently with other partitions.

*Applicant argues, Mittal does not teach "**pre-aggregating database data**, as would be understood by those reasonably skilled in the art".*

Examiner respectfully disagrees. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). While Mittal was relied upon for the providing the limitation of pre-aggregating database data, applicants must keep in mind that the rejection itself relied upon the combination of Mittal in view of Agrawal, and further in view of Ballamkonda. To begin, applicant's specification at paragraph [0040], lines 1-7, defines pre-aggregation as partitioning data, ordering the elements, and eliminating duplicative elements. It is unclear to the examiner how applicant is interpreting who the

demographics would be for the knowledge and understanding of pre-aggregating data, in order for it to be understood by those reasonable skilled in the art, especially when applicant has provided a reasonable understanding within its own description of the specification. It is also unclear whether applicant's intention would be to use the explanation provided within its own specification or if applicant wished to rely upon an alternative definition. As such, as stated in the action above, Figs. 4-5 and paragraph [0058], lines 1-22, wherein each record has dimensions (i.e. partitions) and each dimension is in order and labeled with an order number. Also, Mittal further discloses the limitation of pre-aggregating database data at paragraph [0061].

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Points of Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chelcie Daye whose telephone number is 571-272-3891. The examiner can normally be reached on M-F, 7:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on 571-272-4146. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chelcie Daye
Patent Examiner
Technology Center 2100
November 28, 2006

JEFFREY GAFFIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100